

Name: \_\_\_\_\_

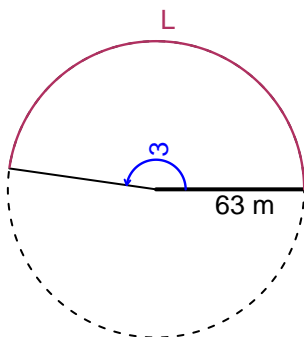
Date: \_\_\_\_\_

## Trig Final (TEST v691)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

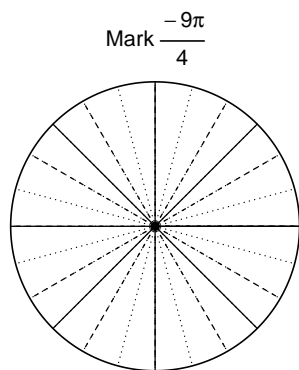
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 63 meters. The angle measure is 3 radians. How long is the arc in meters?

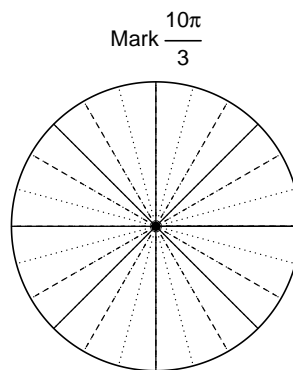


### Question 2

Consider angles  $-\frac{9\pi}{4}$  and  $\frac{10\pi}{3}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\cos\left(-\frac{9\pi}{4}\right)$  and  $\sin\left(\frac{10\pi}{3}\right)$  by using a unit circle (provided separately).



Find  $\cos(-9\pi/4)$



Find  $\sin(10\pi/3)$

**Question 3**

If  $\cos(\theta) = \frac{12}{37}$ , and  $\theta$  is in quadrant IV, determine an exact value for  $\tan(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with an amplitude of 6.83 meters, a frequency of 8.81 Hz, and a midline at  $y = 3.85$  meters. At  $t = 0$ , the mass is at the midline and moving up. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).